

No.

9900427



THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Syngenta Seeds, Inc.

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED DISTINCT VARIETY OF SEXUALLY REPRODUCED, OR TUBER PROPAGATED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF TWENTY YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE ABOVE PURPOSE, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

CORN, FIELD

'NP2213'



In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington, D.C. this twelfth day of September, in the year two thousand three.

Attest:

Commissioner

*Plant Variety Protection Office
Agricultural Marketing Service*

Secretary of Agriculture

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY - PLANT VARIETY PROTECTION OFFICE

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE
(Instructions and information collection burden statement on reverse)

The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a) and the Paperwork Reduction Act (PRA) of 1995.

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF OWNER Syngenta Seeds, Inc.		2. TEMPORARY DESIGNATION OR EXPERIMENTAL NAME		3. VARIETY NAME NP2213	
4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP Code, and Country) P.O. Box 959 Minneapolis, MN 55449		5. TELEPHONE (include area code) (763) 593-7333		FOR OFFICIAL USE ONLY PVPO NUMBER 9900427 FILING DATE Sept. 21, 1999	
		6. FAX (include area code) (763) 593-7828			
7. IF THE OWNER NAMED IS NOT A "PERSON", GIVE FORM OF ORGANIZATION (corporation, partnership, association, etc.) Corporation		8. IF INCORPORATED, GIVE STATE OF INCORPORATION Delaware		9. DATE OF INCORPORATION Sept. 24, 1976	
10. NAME AND ADDRESS OF OWNER REPRESENTATIVE(S) TO SERVE IN THIS APPLICATION: (First person listed will receive all papers) Syngenta Seeds, Inc. Attn: David Young 317 330th Street Stanton, MN 55018				FILING AND EXAMINATION FEES: \$2450.00 DATE 9/21/99 CERTIFICATION FEE: \$432+38 DATE 8/5/03	
11. TELEPHONE (Include area code) (507) 663-7620		12. FAX (Include area code) (507) 645-7519		13. E-MAIL dave.young@syngenta.com	
14. CROP KIND (Common Name) CORN (dent)					
18. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED (Follow instructions on reverse) a. <input checked="" type="checkbox"/> Exhibit A. Origin and Breeding History of the Variety b. <input checked="" type="checkbox"/> Exhibit B. Statement of Distinctness c. <input checked="" type="checkbox"/> Exhibit C. Objective Description of Variety d. <input checked="" type="checkbox"/> Exhibit D. Additional Description of the Variety (Optional) e. <input checked="" type="checkbox"/> Exhibit E. Statement of the Basis of the Owner's Ownership f. <input checked="" type="checkbox"/> Voucher Sample (2,500 viable untreated seeds or, for tuber propagated varieties, verification that tissue culture will be deposited and maintained in an approved public repository) g. <input type="checkbox"/> Filing and Examination Fee (\$2,705), made payable to "Treasurer of the United States" (Mail to the Plant Variety Protection Office)			19. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE SOLD AS A CLASS OF CERTIFIED SEED? See Section 83(a) of the Plant Variety Protection Act <input type="checkbox"/> YES (If "yes", answer items 20 and 21 below) <input checked="" type="checkbox"/> NO (If "no," go to item 22)		
			20. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF CLASSES? <input type="checkbox"/> YES <input type="checkbox"/> NO IF YES, WHICH CLASSES? <input type="checkbox"/> FOUNDATION <input type="checkbox"/> REGISTERED <input type="checkbox"/> CERTIFIED		
			21. DOES THE OWNER SPECIFY THAT THE CLASSES BE LIMITED AS TO NUMBER OF GENERATIONS? <input type="checkbox"/> YES <input type="checkbox"/> NO IF YES, SPECIFY THE NUMBER 1, 2, 3, etc. <input type="checkbox"/> FOUNDATION <input type="checkbox"/> REGISTERED <input type="checkbox"/> CERTIFIED (If additional explanation is necessary, please use the space indicated on the reverse.)		
22. HAS THE VARIETY (INCLUDING ANY HARVESTED MATERIAL) OR A HYBRID PRODUCED FROM THIS VARIETY BEEN SOLD, DISPOSED OF, TRANSFERRED, OR USED IN THE U. S. OR OTHER COUNTRIES? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO IF YES, YOU MUST PROVIDE THE DATE OF FIRST SALE, DISPOSITION, TRANSFER, OR USE FOR EACH COUNTRY AND THE CIRCUMSTANCES. (Please use space indicated on reverse.)			23. IS THE VARIETY OR ANY COMPONENT OF THE VARIETY PROTECTED BY INTELLECTUAL PROPERTY RIGHT (PLANT BREEDER'S RIGHT OR PATENT)? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO IF YES, GIVE COUNTRY, DATE OF FILING OR ISSUANCE AND ASSIGNED REFERENCE NUMBER. (Please use space indicated on reverse.)		
24. The owners declare that a viable sample of basic seed of the variety will be furnished with application and will be replenished upon request in accordance with such regulations as may be applicable, or for a tuber propagated variety a tissue culture will be deposited in a public repository and maintained for the duration of the certificate. The undersigned owner(s) is(are) the owner of this sexually reproduced or tuber propagated plant variety, and believe(s) that the variety is new, distinct, uniform, and stable as required in Section 42, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act. Owner(s) is(are) informed that false representation herein can jeopardize protection and result in penalties.					
SIGNATURE OF OWNER Ronald S. Ferriss			SIGNATURE OF OWNER		
NAME (Please print or type) Ronald S. Ferriss			NAME (Please print or type) original signature on 9/15/99		
CAPACITY OR TITLE Director of Inbred Development		DATE April 24, 2002		CAPACITY OR TITLE DATE	

INSTRUCTIONS

GENERAL: To be effectively filed with the Plant Variety Protection Office (PVPO), ALL of the following items must be received in the PVPO: (1) Complete application form signed by the owner; (2) completed exhibits A, B, C, E; (3) for a seed reproduced variety at least 2,500 viable untreated seeds, for a hybrid variety at least 2,500 untreated seeds of each line necessary to reproduce the variety, or for tuber reproduced varieties verification that a viable (in the seed that it will reproduce an entire plant) tissue culture will be deposited and maintained in an approved public repository; (4) check drawn on a U.S. bank for \$320 filing fee and \$2,385 examination fee), payable to "Treasurer of the United States" (See Section 97.6 of the Regulations and Rules of Practice.) Partial applications will be held in the PVPO for not more than 90 days, then returned to the applicant as unfilled. Mail application and other requirements to Plant Variety Protection Office, AMS, USDA, Room 500, NAL Building, 10301 Baltimore Avenue, Beltsville, MD 20705-2351. Retain one copy for your files. All items on face of the application are self explanatory unless noted below. Corrections on the application form and exhibits must be initialed and dated. **DO NOT** use masking materials to make corrections. If a certificate is allowed, you will be requested to send a check payable to "Treasurer of the United States" in the amount of \$320 for issuance of the certificate. Certificates will be issued to owner, not licensee or agent.

Plant Variety Protection Office

Telephone: (301) 504-5518

FAX: (301) 504-5291

Homepage: <http://www.ams.usda.gov/science/pvp.htm>

ITEM

- 18a. Give:
 - (1) the genealogy, including public and commercial varieties, lines, or clones used, and the breeding method;
 - (2) the details of subsequent stages of selection and multiplication;
 - (3) evidence of uniformity and stability; and
 - (4) the type and frequency of variants during reproduction and multiplication and state how these variants may be identified
- 18b. Give a summary of the variety's distinctness. Clearly state how this application variety may be distinguished from all other varieties in the same crop. A new variety is most similar to one variety or a group of related varieties:
 - (1) identify these varieties and state all differences objectively;
 - (2) attach statistical data for characters expressed numerically and demonstrate that these are clear differences; and
 - (3) submit, if helpful, seed and plant specimens or photographs (prints) of seed and plant comparisons which clearly indicate distinctness.
- 18c. Exhibit C forms are available from the PVPO Office for most crops; specify crop kind. Fill in Exhibit C (Objective Description of Variety) form as completely as possible to describe your variety.
- 18d. Optional additional characteristics and/or photographs. Describe any additional characteristics that cannot be accurately conveyed in Exhibit C. Use comparative varieties as is necessary to reveal more accurately the characteristics that are difficult to describe, such as plant habit, plant color, disease resistance, etc.
- 18e. Section 52(5) of the Act requires applicants to furnish a statement of the basis of the applicant's ownership. An Exhibit E form is available from the PVPO.
19. If "Yes" is specified (*seed of this variety be sold by variety name only, as a class of certified seed*), the applicant **MAY NOT** reverse this affirmative declaration after the variety has been sold and so labeled, the decision published, or the certificate issued. However, if "No" has been specified, the applicant may change the choice. (See *Regulations and Rules of Practice, Section 97.103*).
21. See *Section 83 of the Act for the Contents and Term of Plant Variety Protection*.
22. See *Sections 41, 42, and 43 of the Act and Section 97.5 of the regulations for eligibility requirements*.
23. See *Section 5.5 of the Act for instructions on claiming the benefit of an earlier filing date*.

21. CONTINUED FROM FRONT (Please provide a statement as to the limitation and sequence of generations that may be certified.)

22. CONTINUED FROM FRONT (Please provide the date of first sale, disposition, transfer, or use for each country and the circumstances, if the variety (including any harvested material) or a hybrid produced from this variety has been sold, disposed of, transferred, or used in the U.S. or other countries.)

23. CONTINUED FROM FRONT (Please give the country, date of filing or issuance, and assigned reference number, if the variety or any component of the variety is protected by intellectual property right (Plant Breeder's Right or Patent).)

U.S. patent 6,353,159 issued 3/5/2002

NOTES: It is the responsibility of the applicant/owner to keep the PVPO informed of any changes of address or change of ownership or assignment or owner representative during the life of the application/certificate. There is no charge for filing a change of address. The fee for filing a change of ownership or assignment or any modification of owner's name is specified in Section 97.175 of the regulations. (See *Section 101 of the Act, and Sections 97.130, 97.131, 97.175(h) of the Regulations and Rules of Practice*.)

To avoid conflict with other variety names in use, the applicant must check the variety names proposed by contacting: Seed Branch, AMS, USDA, Room 213 Building 306, Beltsville Agricultural Research Center—East, Beltsville, MD 20705. Telephone: (301) 504-8089.

According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this collection of information is (0581-0055). The time required to complete this information collection is estimated to average 1.4 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, gender, religion, age, disability, political beliefs, sexual orientation, and marital or family status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact the USDA's TARGET at 202-720-2600 (voice and TDD). To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington, DC 20250-9410 or call (202) 720-5964 (voice and TDD). USDA is an equal opportunity provider and employer.

S&T-470 (2-99) designed by the Plant Variety Protection Office with WordPerfect 6.0a. Replaces STD-470 (6-98) which is obsolete.

Syngenta Seeds, Inc.
NP2213
Exhibit A

Origin and Breeding History of Corn Inbred Line NP2213

Inbred line NP2213 was derived from the cross of Pioneer Brand hybrid 3921 and Novartis Inbred Line NP2144. Inbred line NP2144 was derived by self-pollination in Pioneer Brand hybrid 3975. After development of the S_0 (or F_2) population of Pioneer Brand hybrid 3921 x NP2144, the breeding method was simple pedigree ear-to-row development of inbred NP2213.

The details of the development of inbred line NP2213 are as follows:

1990 Harrow, Ontario Crossed Pioneer hybrid 3921 by NP2144 male to produce S_0 seed.

1990 Gisborne, New Zealand Plants of the S_0 were self-pollinated to produce the S_1 . One hundred S_1 ears were selected from individual S_0 plants based upon plant quality, root strength, ear size, and resistance to diseases.

1991 Plattsville, Ontario Three kernels of each of the one hundred selected S_1 families were grown, observed, and self-pollinated to produce the S_2 generation. Phenotypic selection of these S_1 plants was based upon plant quality, synchrony of pollen shed and silk emergence, root strength, ear size, and resistance to disease.

1992 Plattsville, Ontario Three kernels of each of the selected S_2 plants were grown and observed. The S_2 plants were also self-pollinated to produce the S_3 generation. Phenotypic selection of the S_2 plants was based upon plant quality, synchrony of pollen shed and silk emergence, root strength, ear size, and resistance to disease.

1993 Plattsville, Ontario Ear rows of the selected S_3 families were grown and observed. The S_3 families were also self-pollinated to produce the S_4 generation. Phenotypic selection of the S_3 families was based upon plant quality, synchrony of pollen shed and silk emergence, root strength, ear size, and resistance to disease. Test cross pollinations of the S_3 families were also made.

1994 Plattsville, Ontario Ear rows of the selected S_4 families were grown, observed and self-pollinated to produce the S_5 generation. Selection of the S_4 families was based upon performance of the S_3 testcrosses for grain yield, maturity, and general quality. These testcrosses were grown at several locations. Phenotypic selection of the S_4 families was based upon plant quality, synchrony of pollen shed and silk emergence, root strength, ear size, and resistance to disease. Testcrosses of the S_4 families were also made.

1994 Gisborne, New Zealand Ear rows of the selected S_5 families were grown, observed and self-pollinated to produce the S_6 generation. Phenotypic selection of the S_5 families was based upon plant quality, synchrony of pollen shed and silk emergence, root strength, ear size, and resistance to disease.

Syngenta Seeds, Inc.
NP2213
Exhibit A (continued)

1995 Plattsville, Ontario Ear rows of the selected S_6 families were grown, observed and self-pollinated to produce the S_7 generation. Selection of the S_5 families was based upon performance of the S_4 testcrosses for grain yield, maturity, and general quality. These testcrosses were grown at several locations. Phenotypic selection of the S_6 families was based upon plant quality, synchrony of pollen shed and silk emergence, root strength, ear size, and resistance to disease. Testcrosses of the S_6 families were also made.

1996 Plattsville, Ontario Ear rows of the selected S_7 families were grown, observed and self-pollinated to produce the S_8 generation or "Pre-Breeders Seed". These families were closely evaluated and selected for uniformity of anther color, plant and ear height, and other characteristics.

1997 Plattsville, Ontario Rows of one selected S_8 ear culture were grown, closely evaluated and selected for uniformity of anther color, plant and ear height, and other characteristics and self-pollinated to produce the "Breeders Seed".

1997 Kauai, Hawaii Rows of the "Breeders Seed" were grown and self-pollinated. Ears were selected from plants with uniform anther color, plant and ear height, and other characteristics.

1998 Plattsville Ontario Ear rows of the selected ears were grown, closely evaluated and selected for uniformity of anther color, plant and ear height, and other characteristics and self-pollinated to produce additional "breeders seed". Isozyme testing confirmed the purity of this inbred line.

From 1996 to the present, the inbred line NP2213 has been observed in Plattsville, Ontario, Janesville, WI, Hampton, IA, Stanton, MN and other locations. No phenotypic or isozymic variants have been observed. The inbred NP2213 has been uniform and stable.

Syngenta Seeds, Inc.
NP2213
Exhibit B

Distinctness of Corn Inbred Line NP2213

The corn inbred line NP2213 (seed source 8480180) is most similar to the PVP Standard Inbred Line CM105 (seed source S798298). Comparisons of the two varieties were conducted in "side-by-side" trials in 1998 at three different sites. The trial locations were London, Ontario, Canada, Stanton, MN, and Janesville, WI. The trials had two replications at each site. Plot size was 152 cm x 518 cm. Each plot had approximately 70 plants.

Several tables have been included in Exhibit D – Optional Additional Description of Variety, to supply the required information for all quantitative characteristics cited as distinct differences. These additional tables will contain all the statistical information including sample size, mean, LSD (at the 95% confidence level) ANOVA, the probability value, etc. The method used to calculate the statistics of the combined location summary of the traits that have distinct differences use a mean value or a single data entry per replication and does not use all the individual data points per row (subsets). The number of actual data measurements taken per quantitative traits was based upon the recommendations of the Plant Variety Protection Office. Exhibit D – Table 4 or the 1998 NP2213 vs. CM105 Comparisons, contains the grand mean, LSD (95% confidence level), CV%, probability %, and the individual location means. Exhibit D – Table 5, or the 1998 Data – NP2213 vs. CM105 Comparisons – ANOVA Tables, contains additional statistical data. Exhibit D – Table 6, or the Individual Replication Data, contains the data collected at all locations in 1998 for each trait.

NP2213 differs from CM105 for several different traits. These traits are:

NP2213 is a significantly taller inbred than CM105. The plant height of NP2213 is 175 cm. The plant height of CM105 is 166 cm.

NP2213 is an earlier maturity inbred than CM105. The heat unit accumulation to all of the flowering stages is less for NP2213 than CM105. The heat units to 10% Pollen Shed is 1087 for NP2213 and is 1158 for CM105. Heat units to 50% Pollen Shed is 1114 for NP2213 as compared to 1195 for CM105. Heat units to 90% Pollen Shed is 1163 for NP2213 as compared to 1240 for CM105. Heat units to 50% Silk Emergence is 1144 for NP2213 and 1224 for CM105.

The Length of the Ear Node Leaf of NP2213 is significantly shorter at 67 cm as compared to 77 on CM105.

The NP2213 Leaf Angle (2nd leaf above the ear) is 48 degrees and is significantly less than CM105 at 57 degrees.

The Leaf Color of NP2213 is a lighter green than the CM105 leaf. The NP2213 leaf is a medium green (02 or 5GY 5/4) and the CM105 leaf is dark green (03 or 7.5GY 5/4) (see Exhibit D – Table 3).

Syngenta Seeds, Inc.
NP2213
Exhibit B (continued)

Some of the most distinct differences of NP2213 and CM105 occur in the tassel. The most pronounced of these differences is the Tassel Length (see Exhibit D – Table 1). The Tassel Length of NP2213 is significantly longer at 38 cm than CM105 at 31 cm. Another tassel difference is the anther and glume colors of the two inbreds. The Anther Color of NP2213 is pale yellow (06 or 5Y 8/8) (See Exhibit D – Table 2). The Anther color of CM105 is green/yellow (05) with pale purple shading (16) (see Exhibit D – Table 2). The Glume Color of NP2213 is green/yellow (05 or 5GY 5/10) (see Exhibit D – Table 2). The Glume Color of CM105 is medium green (02) with some purple (17) shading (see Exhibit D – Table 2). Some of the glume margins on NP2213 appear to be purple (17) (see Exhibit D – Table 2).

Another pronounced difference of these two inbreds is the color of the silk (see Exhibit D – Table 3). The silk color of NP2213 is green-yellow (05) with pale purple shaded ends (16). The CM105 silk is green-yellow (05 or 2.5GY 8/8).

The Ear Diameter of NP2213 is significantly smaller than the CM105 ear. NP2213 is 32 mm. And CM105 is 35 mm.

The Number of Kernel Rows on NP2213 is 15 as compared to CM105 at 13. NP2213 has significantly more kernel rows.

The NP2213 kernel width is 6 mm, which is significantly narrower than the CM105 kernel at 8 mm.

The Cob Diameter of NP2213 is significantly smaller at 22 mm than CM105 at 24 mm.

NP2213 has a 5 rating for Marginal Waves, which is significantly different than CM105, which was rated a 3.

The Cob Color of NP2213 is white (19 or N9.5/) while CM105 is light red (12 or 2.5YR 5/6).

NP2213 is a distinct and unique inbred line.

OBJECTIVE DESCRIPTION OF VARIETY

CORN (*Zea mays* L.)

[illegible]

Applicant Variety Data				Page 2	Standard Inbred Data					
5. LEAF:				Standard Deviation	Sample Size	Standard Deviation				Sample Size
*	007.1	cm Width of Ear Node Leaf		0.50	6	007.2	0.23		6	
*	067.1	cm Length of Ear Node Leaf		7.57	6	077.4	6.33		6	
*	04	Number of leaves above top ear		0.53	6	05	0.32		6	
	048	degrees Leaf Angle (measure from 2 nd leaf above ear at anthesis to stalk above leaf)		2.50	6	057	5.77		6	
*	03	Leaf Color (Munsell code 5GY 5/4)				02	(Munsell code 7.5GY 5/4			
	6	Leaf Sheath Pubescence (Rate on scale from 1=none to 9=like peach fuzz)				6				
	5	Marginal Waves (Rate on scale from 1=none to 9=many)				3				
	4	Longitudinal Creases (Rate on scale from 1=none to 9=many)				7				
6. TASSEL:										
*	04	Number of Primary Lateral Branches		0.50	6	04	1.35		6	
	041	Branch Angle from Central Spike		9.46	6	046	16.65		6	
*	38.1	Cm Tassel Length (from top leaf collar to tassel tip)		1.47	6	31.3	0.65		6	
	7	Pollen Shed (Rate on scale from 0=male sterile to 9=heavy shed)				6				
	06	Anther Color (Munsell code 5Y 8/8)				26	(Munsell code)			
	05	Glume Color (Munsell code 5GY 5/10)				26	(Munsell code)			
	2	Bar Glumes (Glume Bands): 1=Absent 2=Present				2				
7a. EAR (Unhusked Data):										
*	26	Silk Color (3 days after emergence) (Munsell code)				05	(Munsell code 2.5GY 8/8)			
	05	Fresh Husk Color(25 days after 50% silking) (Munsell code 5GY 7/6)				05	(Munsell code 5GY 7/6)			
	22	Dry Husk Color (65 days after 50 % silking) (Munsell code 2.5Y 8/4)				22	(Munsell code 2.5Y 8/4)			
*	3	Position of Ear at Dry Husk Stage: 1=Upright 2=Horizontal 3=Pendent				3				
	2	Husk Tightness (Rate on scale from 1=very loose to 9=very tight)				3				
	3	Husk Extension (at harvest): 1=Short (ears exposed) 2=Medium (<8cm) 3=Long (8-10 cm beyond ear tip) 4=Very long (>10 cm)				3				
7b. EAR (Husked Ear Data):										
				Standard Deviation	Sample Size		Standard Deviation		Sample Size	
*	15.4	cm Ear Length		1.42	6	13.9	1.98		6	
*	32.2	mm Ear Diameter at mid-point		1.96	6	35.4	3.44		6	
	083.8	gm Ear Weight		7.79	6	081.8	20.40		6	
*	15	Number of Kernel Rows		0.23	6	13	0.44		6	
	2	Kernel Rows: 1=Indistinct 2=Distinct				2				
	1	Row Alignment: 1=Straight 2=Slightly Curved 3=Spiral				2				
	13.1	cm Shank Length		1.04	6	10.6	4.94		6	
	2	Ear Taper: 1=Slight 2=Average 3=Extreme				2				
Application Variety Data						Standard Inbred Data				
Note: Use chart on first page to choose color codes for color traits										

Applicant Variety Data				Page 3	Standard Inbred Data			
8. KERNEL (Dried):		Standard Deviation	Sample Size		Standard Deviation		Sample Size	
09.2	mm Kernel Length	0.58	6		09.2	0.29	6	
06.3	mm Kernel Width	0.58	6		07.5	0.00	6	
04.5	mm Kernel Thickness	0.55	6		04.3	0.29	6	
48.2	% Round Kernels (Shape Grade)	2.93	6		32.3	18.37	6	
1	Aleurone Color Pattern: 1=Homozygous 2=Segregating				1			
* 26	Aleurone Color (Munsell code)				26	(Munsell code)		
* 07	Hard Endosperm Color (Munsell code 2.5Y 8/8)				07	(Munsell code 2.5Y 8/10)		
* 3	Endosperm Type: 1=Sweet (su1) 2=Extra Sweet (sh2) 3=Normal Starch 4=High Amylose Starch 5=Waxy Starch 6=High Protein 7=High Lysine 8=Super Sweet (se) 9=High Oil 10=Other				3			
19.5	gm Weight per 100 Kernels (unsized sample)	19.49	6		21.4	3.90	6	
9. COB		Standard Deviation	Sample Size		Standard Deviation		Sample Size	
* 22.1	mm Cob Diameter at mid-point	1.21	30		23.5	1.10	6	
19	Cob Color (Munsell code N9.5/)				12	(Munsell code 2.5YR 5/6)		
10. DISEASE RESISTANCE (Rate from 1 (most susceptible) to 9 (most resistant): leave blank if not tested: leave Race or Strain Options blank if polygenic):								
A. Leaf Blights, Wilts, and Local Infection Diseases								
Anthracnose Leaf Blight (<i>Colletotrichum graminicola</i>) Common Rust (<i>Puccinia sorghi</i>) Common Smut (<i>Ustilago maydis</i>) 7 Eyespot (<i>Kabatiella zeae</i>) Goss's Wilt (<i>Clavibacter michiganense</i> spp. <i>Nebraskense</i>) Gray Leaf Spot (<i>Cercospora zeae-maydis</i>) Helminthosporium Leaf Spot (<i>Bipolaris zeicola</i>) Race 7 Northern Leaf Blight (<i>Exserohilum turcicum</i>) Race 1 Southern Leaf Blight (<i>Bipolaris maydis</i>) Race Southern Rust (<i>Puccinia polysora</i>) Stewart's Wilt (<i>Erwinia stewartii</i>) Other (Specify)					5 8 Race Race 1 Race			
B. Systemic Diseases								
Corn Lethal Necrosis (MCMV and MDMV) Head Smut (<i>Sphacelotheca reiliana</i>) Maize Chlorotic Dwarf Virus (MCDV) Maize Chlorotic Mottle Virus (MCMV) Maize Dwarf Mosaic Virus (MDMV) Strain Sorghum Downy Mildew of Corn (<i>Peronosclerospora soghi</i>) Other (Specify)					Strain			
C. Stalk Rots								
Anthracnose Stalk Rot (<i>Colletotrichum graminicola</i>) Diplodia Stalk Rot (<i>Stenocarpella maydis</i>) Fusarium Stalk Rot (<i>Fusarium moniliforme</i>) Gibberella Stalk Rot (<i>Gibberella zeae</i>) Other (Specify)								
Ear and Kernel Rots								
Aspergillus Ear and Kernel Rot (<i>Aspergillus flavus</i>) Diplodia Ear Rot (<i>Stenocarpella maydis</i>) Fusarium Ear and Kernel Rot (<i>Fusarium moniliforme</i>) Gibberella Ear Rot (<i>Gibberella zeae</i>) Other (Specify)								
Application Variety Data					Standard Inbred Data			
Note: Use chart on first page to choose color codes for color traits								

Applicant Variety Data		Page 4	Standard Inbred Data	
11. INSECT RESISTANCE (Rate from 1 (most susceptible) to 9 (most resistant): leave blank if not tested: Banks Grass Mite (<i>Oligonychus pratensis</i>) Standard Deviation Size Sample Corn Earworm Leaf-Feeding Silk-Feeding: mg larval wt. Ear Damage Corn Leaf Aphid (<i>Rhopalosiphum maidis</i>) Corn Sap Beetle (<i>Carpophilus dimidiatus</i>) European Corn Borer (<i>Osstrinia nubilalis</i>) 2 1 st Generation (Typically Whorl Leaf Feeding) 2 nd Generation (Typically Leaf Sheath-Collar feeding) Stalk Tunneling: cm tunneled /plant Fall Armyworm Leaf-Feeding Silk-Feeding: mg larval wt. Maize Weevil (<i>Sitophilus zeamaze</i>) Northern Rootworm (<i>Diabrotica barberi</i>) Southern Rootworm (<i>Diabrotica undecimpunctata</i>) Southwestern Corn Borer (<i>Diatraea grandiosella</i>) Leaf-Feeding Stalk Tunneling: cm tunneled/plant Twospotted Spider Mite (<i>Tetranychus urticae</i>) Western Rootworm (<i>Diabrotica virgifera virgifera</i>)			Standard Deviation Sample Size 4	
12. AGRONOMIC TRAITS:				
9 Stay Green (at 65 days after anthesis) (rate on scale from 1=worst to 9=excellent.)			9	
0 % Dropped Ears (at 65 days after anthesis)			0	
1 % Pre-anthesis Brittle snapping			0	
0 % Pre-anthesis Root Lodging			0	
0 % Post-anthesis Root Lodging (at 65 days after anthesis)			0	
Kg/ha Yield of Inbred Per Se (at 12-13% grain moisture)				
13. MOLECULAR MARKERS: (0=data unavailable: 1 data available but not supplied: 2=data supplied)				
1	Isozymes	RFLP's	RAPD's	
REFERENCES: Butler, D.R. 1954. A System for the Classification of corn Inbred Lines. PhD thesis. Ohio State University. Emerson, R. A., G.W. Beadle, and A.C. Fraser. 1935. A Summary of Linkage Studies in Maize. Cornell A.E.S., Mem. 180 Farr, D.F., G.F. Bills, G.P. Chamuris, A.Y. Rossman. 1989. Fungi on Plant and Plant Products in the United States. The American Phytopathological Society, St. Paul, MN. Inglett, G.E. (Ed) 1970. Corn: Culture, Processing, Products. Avi Publishing Company, Westport, CT. Jugenheimer, R.W. 1976. Corn: Improvement. Seed Production, and Uses. John Wiley & Sons, New York. McGee, D.C. 1988. Maize Diseases. AOS Press, St. Paul, MN. 150 pp. Munsell Color Chart for Plant Tissues. Mabeth. P.O. Box 230. Newburgh, N.Y. 12551-0230 The Mutants of Maize. 1968. Crop Science Society of America. Madison, WI. Shurtleff, M.C. 1980. Compendium of Corn Diseases. APS Press, St. Paul, MN. 105 pp. Sprague, G.F., and J.W. Dudley (Editors). 1988 Corn and Corn Improvement, Third Edition. Agronomy Monograph 18. ASA, SCCA, SSSA, Madison, WI. Stringfield, G.H. Maize Inbred Lines of Ohio. Ohio A.E.S., Bul. 831. 1959 U.S. Department of Agriculture. 1936, 1937. Yearbook.				

COMMENTS (eg. state how heat units were calculated, standard inbred seed source, and /or where data was collected. Continue in Exhibit D):

- 1) Large standard deviations are probably due to environmental factors at each individual location where the variety was observed. Since the varieties reported in this exhibit are inbreds, the response to the environment is probably more pronounced than a hybrid or a combination of these inbred lines. Any stress at specific times during the growing season could influence results.
- 2) Heat units per day were calculated using the standard formula: $HU = [\text{Max temp (86)} + \text{Min Temp (50)}] / 2 - 50$.
- 3) Data for this exhibit was collected at London, Ontario, Canada, Stanton, MN, and Janesville, WI.
- 4) The tip and margins on the NP2213 glume appear to be 17 or purple.
- 5) NP2213 silk color is 05 or green/yellow (2.5GY 8/8) with 16 or pale purple shaded ends.
- 6) Anther color of CM105 appears to be 05 or green/yellow with some 16 or pale purple shading.
- 7) CM105 glume appears to be 02 or medium green with some 17 or purple shading.
- 8) CM105 glume has 17 or purple tips.
- 9) The Aleurone Color of NP2213 is white (19) with purple shading (17 or 5RP 5/6)
- 10) The Aleurone Color of CM105 is white (19) with purple shading (17 or 5RP 5/6)
- 11) Disease and Insect data for NP2213 was collected in 1997.
- 12) Disease and Insect data for CM105 was collected in 1996.

Syngenta Seeds, Inc.
1998 Data - NP2213 vs. CM105 Comparisons
Exhibit 9 - Table 4

Combined Summary:

Grand Mean
Trials w/data
LSD (=95% confidence level)
CV %
Probability %

CM105
NP2213

Plant Height cm	H.U. to 50% Silk*	H.U. to 10% Pollen Shed*	H.U. to 90% Pollen Shed*	H.U. to 50% Pollen Shed*
170	1184	1122	1202	1154
3	3	3	3	3
9	18	71	21	18
5	1	2	1	1
4	0	5	0	0
165	1224	1158	1240	1195
175	1144	1087	1163	1114

Individual Location data - CM105:

1998 London, Ontario, Canada
1998 Stanton, MN
1998 Janesville, MN
Mean

145	1204	1146	1240	1166
186	1179	1106	1178	1143
166	1288	1222	1302	1275
166	1224	1158	1240	1195

Individual Location data - NP2213:

1998 London, Ontario, Canada
1998 Stanton, MN
1998 Janesville, WI
Mean

152	1126	1063	1146	1096
206	1081	1014	1094	1036
168	1224	1183	1250	1210
175	1144	1087	1163	1114

Note: * = Heat Unit Formula is located in Exhibit C, Page 4, Comments section.

Syngenta Seeds, Inc.
1998 Data - NP2213 vs. CM105 Comparisons
Exhibit B - Table 4

Combined Summary:

Grand Mean	72	52	35	34
Trials w/data	3	3	3	3
LSD (=95% confidence level)	3	8	3	2
CV %	4	13	8	6
Probability %	0	3	0	0
CM105	77	57	31	35
NP2213	67	48	38	32

Individual Location data - CM105:

1998 London, Ontario, Canada	71	60	32	32
1998 Stanton, MN	83	50	32	39
1998 Janesville, MN	79	60	31	36
Mean	78	57	32	36

Individual Location data - NP2213:

1998 London, Ontario, Canada	59	45	38	30
1998 Stanton, MN	72	50	40	34
1998 Janesville, WI	71	48	37	32
Mean	67	48	38	32

Syngenta Seeds, Inc.
 1998 Data - NP2213 vs. CM105 Comparisons
 Exhibit B - Table 4

Combined Summary:

Grand Mean
 Trials w/data
 LSD (=95% confidence level)
 CV %
 Probability %

CM105
 NP2213

Number of Kernel Rows	Kernel Width (mm)	Cob Diameter (mm)	Leaf Marginal Waves
14	7	23	4
3	3	3	3
1	1	1	1
5	9	5	14
0	0	3	0
13	8	24	3
15	6	22	5

Individual Location data - CM105:

1998 London, Ontario, Canada
 1998 Stanton, MN
 1998 Janesville, MN
 Mean

14	8	23	2
13	8	24	3
13	8	25	4
13	8	24	3

Individual Location data - NP2213:

1998 London, Ontario, Canada
 1998 Stanton, MN
 1998 Janesville, WI
 Mean

15	7	21	4
15	6	22	4
14	6	23	7
15	6	22	5

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

EXHIBIT E
STATEMENT OF THE BASIS OF OWNERSHIP

The following statements are made in accordance with the Private Plant Variety Protection Act (5 U.S.C. 552a) and the Paperwork Reduction Act (PRA) of 1995.

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF APPLICANT(S) Syngenta Seeds, Inc	2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER	3. VARIETY NAME NP2213
4. ADDRESS (Street and No., or R.F.D. No., City, State, and ZIP, and Country) P.O. Box 959 Minneapolis, MN 55440	5. TELEPHONE (include area code) (763) 593-7333	6. FAX (include area code) (763) 593-7828
	7. PVPO NUMBER 9900427	

8. Does the applicant own all rights to the variety? Mark an "X" in appropriate block. If no, please explain. ☒ YES ☐ NO

9. Is the applicant (individual or company) a U.S. national or U.S. based company?
If no, give name of country ☒ YES ☐ NO

10. Is the applicant the original owner? ☒ YES ☐ NO If no, please answer one of the following:

a. If original rights to variety were owned by individual(s), is (are) the original owner(s) a U.S. national(s)?

☐ YES ☐ NO If no, give name of country

b. If original rights to variety were owned by a company(ies), is(are) the original owner(s) a U.S. based company?

☐ YES ☐ NO If no, give name of country

11. Additional explanation on ownership (if needed, use reverse for extra space):

Inbred NP2213 was developed by the Syngenta breeder Bruce Skillings, working primarily from Plattsville, Ontario, Canada (see exhibit A for detail). Skillings was a breeder for Ciba Seeds at the beginning of the line's development, and was employed by Novartis Seeds (formed by the merger of Ciba and Sandoz) at the completion of the line's development in 1998. This line is now exclusively owned by Syngenta Seeds (formed by the merger of the agribusinesses of Novartis and Zeneca in 1999).

PLEASE NOTE:

Plant variety protection can be afforded only to owners (not licensees) who meet one of the following criteria:

1. If the rights to the variety are owned by the original breeder, that person must be a U.S. national, national of a UPOV member country, or national of a country which affords similar protection to nationals of the U.S. for the same genus and species.
2. If the rights to the variety are owned by the company which employed the original breeder(s), the company must be U.S. based, owned by nationals of a UPOV member country, or owned by nationals of a country which affords similar protection to nationals of the U.S. for the same genus and species.
3. If the applicant is an owner who is not the original owner, both the original owner and the applicant must meet one of the above criteria.

The original breeder/owner may be the individual or company who directed final breeding. See Section 41(a)(2) of the Plant Variety Protection Act for definition.

According to the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 0581-0055. The time required to complete this information collection is estimated to average 10 minutes per response, including the time for reviewing instruction, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in its programs on the basis of race, color, national origin, sex, religion, age, disability, political beliefs, and marital or familial status. (Not all prohibited bases apply to all programs). Persons with disabilities who require alternative means for communication of program information (braille, large print, audiotape, etc.) should contact USDA's TARGET Center at 202-720-2600 (voice and TDD).

To file a complaint, write the Secretary of Agriculture, U.S. Department of Agriculture, Washington, D.C. 20250, or call 1-800-245-6340 (voice) or (202) 720-1127 (TDD). USDA is an equal employment opportunity employer.

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